Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Recommendations of	)	PS Docket 12-74
The Technical Advisory Board	)	
For First Responder Interoperability	)	

To: Chief, Public Safety and Homeland Security Bureau

COMMENTS OF XANADOO COMPANY

Xanadoo Company ("Xanadoo"), licensee of 23 licenses in the A Block of Upper 700 MHz spectrum through its subsidiary, Pegasus Guardband, LLC ("Pegasus"), congratulates the Interoperability Board on its timely fulfillment of the responsibilities entrusted to it by the Middle Class Tax Relief and Job Creation Act of 2012.

Xanadoo also commends the Board for setting forth as one of its "two key assumptions" that it could "not assume any particular network architecture."[1] This key assumption assures that FirstNet will have the flexibility in its forthcoming Request for Proposal(s) ("RFP") to solicit input from respondents on ALL network configurations authorized in the LTE standard as set forth in 3GPP's Release 9.

In designing its RFP, Xanadoo believes that FirstNet should avail itself of this flexibility to solicit respondents on the feasibility of building for FirstNet a Nationwide Public Safety Broadband Network using paired 20 MHz channels rather than paired 10 MHz channels. Twenty

[1] Recommended Minimum Technical Requirements to Ensure Nationwide Interoperability for the Nationwide Public Safety Broadband Network, Final Report ¶ 3.3.1 at 24 (May 22, 2012)
[2] Upper 700 Public Safety Flexible Use Spectrum was formerly allocated as Public Safety Narrowband but is now,

(20) MHz channels - which are specifically authorized under the LTE standard – have the following material advantages over 10 MHz channels:

(1) *Substantially Greater Peak Data Rate Capacity:* 20 MHz channel widths will support peak data rates that are least twice that of 10 MHz channel widths. Peak data rate capacity is likely to be considerably more important for public safety users than for commercial users.

(2) *Inherently Greater Flexibility for Accommodating Different Usage Patterns:* Because of its greater throughput capacity and its higher peak data rates, 20 MHz channels can more flexibly accommodate changing mixes of bursty and continuous data rate usage patterns.

(3) *Greater Spectral Efficiency in the Upper 700 MHz Band:* Deployment of 20 MHz channels in Public Safety's Upper 700 MHz spectrum will enable use of spectrum that would otherwise be unutilized or underutilized if 10 MHz channel widths are deployed. (20 MHz channels would enable use of the A and B Blocks, currently unused portions of Verizon's C Block, as well as use of the Public Safety guardband and "Flexible Use"[2] spectrum – a total of 20 MHz of valuable 700 MHz spectrum.)

(4) *Substantially Greater Economic Efficiency:* The cost of building and operating the Public Safety Nationwide Broadband Network utilizing paired 20 MHz channels is not likely to be materially greater than building a network using paired 10 MHz channels. But a network using paired 20 MHz channels will have twice the data capacity, which means that the effective unit cost (measured in cost per bit per second of data capacity) for a 20 MHz channel network is likely to be approximately 50% of that for a 10 MHz channel

[2] Upper 700 Public Safety Flexible Use Spectrum was formerly allocated as Public Safety Narrowband but is now, by statute, flexible use spectrum under the discretion of the FCC.

network. Put differently, assuming that the "covered lease" rate paid by commercial users would be the same for both 10 MHz and 20 MHz channels, the revenue per dollar of capital expenditure incurred in building and operating a 20 MHz network for FirstNet is likely to be twice what it would be for a 10 MHz channel network. This economic efficiency could be a material aid to FirstNet in meeting its statutory mandate to be self-funding after it has spent its statutory construction allowance.

There are two primary architectures that would allow 20 MHz carriers to be used in construction of FirstNet's Public Safety Nationwide Broadband Network:

- **Option 1**: 20 MHz channels spanning Verizon's C-Block, the A-Block and the Public Safety Broadband spectrum;

- **Option 2**: 20 MHz channels spanning the A-Block, the Public Safety Broadband spectrum, the Public Safety Guardband spectrum and the Public Safety Flexible Use spectrum.

Option 1 would require agreement among FirstNet and the Upper 700 C-Block licensee (Verizon Wireless) and the A Block licensees (primarily Pegasus and Access Spectrum, LLC) to pool their licensed spectrum in a shared radio access network. Option 2 would alternatively require agreement among FirstNet and the A-Block licensees, as well as authorization by the FCC to enable inclusion of the Public Safety Guardband and Flexible Use spectrum in a shared radio access network.

- **Elaboration of Option 1:** The 11 MHz C-Block + 1 MHz A-Block + 8 MHz (of 10 MHz) PS BB would create a 20 MHz block and also enable 3 MHz spacing to the public safety "flexible use" spectrum. The proposed band would produce 3 MHz between broadband uplink and broadband downlink to the narrowband public safety downlink with 11 MHz duplex spacing.

- **Elaboration of Option 2:** The 1 MHz A-Block + 10 MHz PS BB + 1 MHz Public Safety Guard Band + 6 MHz PS Flexible Use + 1 MHz B Block configuration would create a 19 MHz block. As in Option 1, the duplex spacing would be 11 MHz. (Versions of this Option 2 could be implemented that would protect currently deployed narrowband users in the Public Safety Flexible Use spectrum while allowing for the future expansion of the FirstNet network in those areas to a full 19 MHz. [3] In such instances, the spacing to incumbent narrowband users' downlink spectrum could be controlled by the base station controller.)[4]

In summary, the use of 20 MHz channels in the FirstNet Public Safety Nationwide Broadband Network would enable a two fold increase in peak data rates, increased flexibility to accommodate changing patterns of use, a 50% reduction in the capital cost in data capacity per bit per second (put differently, a two fold increase in revenue potential from "covered leasing" per dollar of capital expenditures) and would provide much higher spectral efficiency through a full utilization of the Upper 700 MHz band. (In Option 1 the incorporation of 1 MHz of the C Block unused in Verizon's current 10 MHz channel configuration, as well as the 1 MHz A Block enables usage of 4 MHz of nationwide spectrum that would otherwise lie unused or underused. In Option 2, the addition of the A Block, B Block, the Public Safety Guardband and the Public Safety Flexible Use spectrum would convert 20 MHz of Upper 700 MHz spectrum for broadband use that would either be unused or underused.)

[3] 19 MHz bandwidth can be supported by 20 MHz carrier technology through the appropriate subcarrier on/off selection.

[4] This can be accomplished using mechanisms developed by the 3GPP for the Upper 700 MHz C-Block (aka Band 13) for UE transmissions that may interfere with public safety narrowband reception.

For all of these reasons, Xanadoo commends the Interoperability Board for crafting its Final Report so as to accommodate a variety of carrier configurations and looks forward to the further development of the FirstNet RFP based upon the Board's minimum technical requirements.

Respectfully submitted,

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